CHILDREN'S HOSPITAL • BOSTON *1998*

Children's Hospital strives to bring the values of excellence, sensitivity and leadership to the endeavors of patient care, research, training and service to the community.

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Cover photo:
Gaby Cavallacci, case manager at Children's Community Early Intervention Program in Mission Hill, holds Natia, 3.
See feature article on page 28.

MESSAGE FROM THE CHAIRMAN AND CHIEF EXECUTIVE OFFICER

William L. Boyan, chairman of the Board of Trustees, and David S. Weiner, chief executive officer

Almost daily, local and national media report on the continuing pressures that managed care and shrinking federal reimbursement place on the nation's academic medical centers. Children's is certainly not immune to these pressures. Yet, the challenges we face have not detracted from our determination to remain an independent institution dedicated to the very highest standards of pediatric care, in collaboration with community-based pediatric providers.

We understood when we made this decision in 1994 that the strategy would require a significant investment in the organization's infrastructure. And we have begun to see a return on our investment, as Children's Hospital is caring for more children than ever before. Since 1994, Children's share of the Massachusetts pediatric inpatient population has increased by nearly 7 percent – a significant accomplishment in today's marketplace with its shift of care delivery to outpatient settings.

Our ability to offer high-quality care to more children is the result of a major recruitment effort that added 60 physicians to the medical staff last year. These highly capable pediatric specialists have been delivering care and services at our Longwood Avenue campus, as well as at a growing number of community-based specialty clinics throughout Eastern Massachusetts. Our physicians now deliver outpatient specialty care at six community-based locations and offer inpatient specialty care, nursery services and/or emergency services at five community hospitals, and consultative services to several more.

Strong and mutually beneficial relationships with community hospitals and primary care providers are critical to the success of our decision to remain independent. To further cultivate these partnerships, in 1998 we established an Office of Physician Relations and, last September, Michael I. Grady, M.D., was appointed to the new position of vice president for Managed Care. Dr. Grady is working to represent both community pediatricians and Children's specialists in contract negotiations with HMOs in the region. By coming together, specialty and primary care providers can ensure that children receive the most appropriate care delivered in the most appropriate setting.

In order to achieve the organizational performance improvements crucial to the success of our strategy, a Chairman's Task Force on Organization and Governance was convened in February 1998. The task force recommended a number of far-reaching changes to the governance of the institution to foster greater physician involvement in the hospital's strategic and operational decision-making.

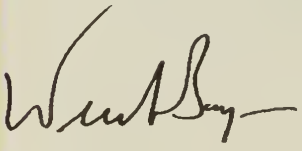
One significant change was the establishment of a senior body, called the Cabinet (see list of Cabinet members on page 37). Composed of six physicians, the chairman of the Board of Trustees, the chief executive officer, and the president and chief operating officer, the Cabinet is an effective forum for building shared objectives for major policy, strategy and operational issues among physician and administrative leaders.

Another task force recommendation was a new structure and role for Children's Physicians' Organization (PO). With a new Board of Directors and a Physician Leadership Council, composed of both appointed and elected members, a broader, more democratic voice has been established for our medical staff. The PO is working at an unprecedented level of collaboration with the hospital, creating a true partnership for the oversight of the hospital's clinical operations.

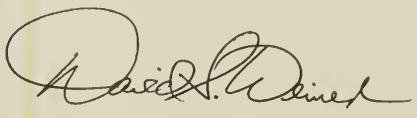
These bodies work in concert with a new management team chosen for skills and experience in tackling financial challenges and operational issues. Last October, we welcomed Stephen R. Laverty as hospital president and chief operating officer, following a six-year term as president of Winchester Hospital. He joined David A. Kirshner, chief financial officer, and Lac V. Tran, chief information officer, both of whom arrived in fiscal year 1998.

Recognizing the growing importance of philanthropic support during this difficult time for health care, in 1998, the hospital Board of Trustees voted to launch the Children's Hospital Trust, a new entity encompassing all of the hospital's fund-raising programs and aimed at advancing philanthropy for Children's. Headed by Janet B. Cady, president and chief operating officer of the Trust, and Stephen R. Karp, chairman of the Trust board, this growing organization is engaging new trustees, along with medical staff, philanthropists and community leaders, in a process designed to significantly increase charitable support for Children's.

Children's has accomplished a great deal in the last year. We have strengthened our position in an increasingly competitive marketplace, implemented a new governance structure and made strides toward improving operating efficiencies. Our success is testimony to the hard work and the commitment to excellence of all Children's staff. As we move ahead to the next millennium, we will continue to build on that collective strength, with our eyes always on the real bottom line: advancing the health of children through research and education, and ensuring that every child receives the very best care possible.



William L. Boyan
Chairman of the Board of Trustees



David S. Weiner
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NEW LEADERSHIP WELCOMED

In 1998, Children's Hospital welcomed a new chairman of the Board of Trustees, a new hospital president and a new surgeon-in-chief. All three individuals bring strong leadership records to their new roles and are helping to steer the institution as it continues to chart a course to remain an independent pediatric medical center.

New chairman elected

In January 1998, **William L. Boyan** assumed the role of chairman of Children's Board of Trustees. Prior to his election as chairman, Boyan served as the board's vice chairman for five years and as a board member since 1983.

Former president and vice chairman of the Board of John Hancock Mutual Life Insurance Company, Boyan is a well-known advocate for children and youth. In addition to his service to Children's Hospital, he has chaired the Boston Plan for Excellence in Public Schools program and is chairman of the Boston Annenberg Challenge, which raises and oversees the investment of funds in the Boston Public Schools.

Boyan's expertise in financial and strategic planning, in addition to his experience in generating corporate philanthropic support, is positioning Children's to meet the challenges of the next century.

Laverty appointed president and COO

In October 1998, **Stephen R. Laverty** joined Children's Hospital as president and chief operating officer. In this newly created position, Laverty assumed responsibility for the daily operations and management of the hospital, reporting to David S. Weiner, chief executive officer.

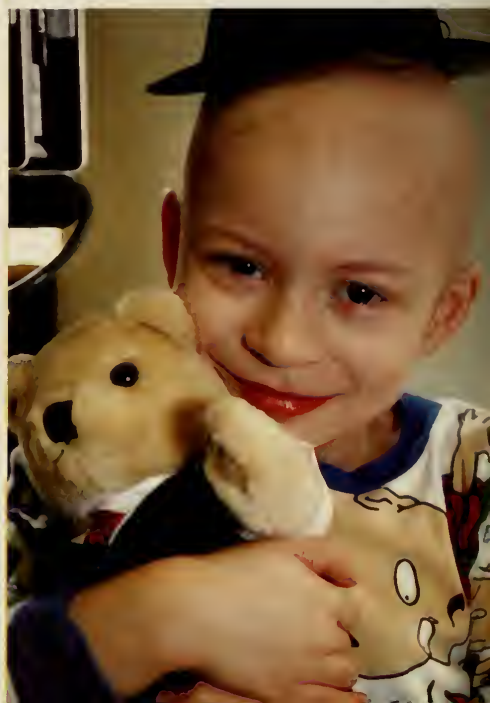
Before coming to Children's, Laverty was president and chief executive officer of Winchester Hospital for six years. He also served as chief financial officer at Winchester Hospital and, prior to that, directed financial services at St. Elizabeth's and Brigham and Women's hospitals.

Laverty brings to Children's a vision for enhancing performance across hospital systems and programs, as well as a demonstrated commitment to excellence in care delivery for children and families.

Ziegler appointed new surgeon-in-chief

Moritz M. Ziegler, M.D., joined Children's Hospital as surgeon-in-chief and chairman of the Department of Surgery in July 1998. Prior to his arrival, he was surgeon-in-chief and director of the Division of Pediatric Surgery at Children's Hospital Medical Center in Cincinnati. He has special expertise in transplantation and oncologic surgery, as well as nutrition support for surgical patients.

Ziegler is recognized as a leader and innovator in restructuring clinical and training programs to meet the challenges of today's health care environment. At Children's, he serves as chairman of the Surgical Executive Committee and the Operating Room Committee, and participates in overall hospital strategic planning through his membership on the Cabinet and Board of Trustees.



BRINGING THE BEST IN CARE AND SERVICES

Children's Hospital strives for excellence in patient care – a standard that extends to the health and well-being of a patient's entire family. Staff members are continually improving outcomes for children with all types of illnesses and injuries, as well as finding ways to make the hospital experience as positive as possible.

Children's ranked top pediatric medical center in country

Children's Hospital, Boston, was named the best pediatric hospital in the nation by an annual survey published by *U.S. News & World Report* in July 1998. Children's has received this number-one ranking for each of the nine years the magazine has conducted the survey among physicians across the country.

First pediatric center for holistic medicine formed

In 1998, Children's Hospital established the first pediatric holistic medicine program in the country.

The new Center for Holistic Pediatric Education and Research is evaluating complementary and alternative approaches to medical treatment, including acupuncture, herbal remedies, homeopathy, healing touch and prayer. Under the direction of **Kathi J. Kemper, M.D., M.P.H.**, the center is the first to evaluate the safety of herbs for children.

Program responds to needs of international families

In May 1998, Children's Hospital welcomed **Carol A. Sayles** as the new director of International Health Services. Since her arrival, Sayles has worked with clinical departments to expand access to children from abroad who can be helped by the specialty and tertiary care provided at Children's.

As part of this effort, Sayles has built a multilingual team to staff Children's International Center for Families. The center facilitates all aspects of international families' experiences at the hospital, from medical and financial screening, to triage and appointment scheduling, to assisting with housing needs, transportation and language services.

In addition, Sayles directs business development efforts, including cultivating relationships with foreign businesses, civic and government entities, and negotiating international provider agreements.

Sandra L. Helmers, M.D., neurologist, holds a vagus nerve stimulator. The new device improves quality of life for patients with epilepsy and other seizure disorders.

Implant controls seizures

In late 1997, Children's Hospital became one of the first pediatric centers to use a new surgically implanted device, called the vagus nerve stimulator, to control intractable seizures in young children. Implanted in the chest just under the skin, the round, metal device is programmed to send electrical currents to the vagus nerve in the neck. The painless shocks to the nerve successfully shorten or stop oncoming seizures.

The vagus nerve stimulator is a novel and effective treatment for frequent and unpredictable seizures that cannot be managed with medication. Since December 1997, 80 patients with epilepsy or other serious seizure disorders have received the device at Children's Hospital, making Children's the world's largest pediatric center for the vagus nerve stimulator.

ADVOCATING ON BEHALF OF CHILDREN

Throughout 1998, Children's Hospital continued its work toward improving the health and well-being of children through advocacy efforts. The institution combined local efforts with support for state and federal legislative initiatives that will improve the health of children, now and into the future.

"1,000 More Healthy Kids" goal attained

When the Commonwealth of Massachusetts expanded programs to make it possible for every child in the state to be insured, staff at Martha Eliot Health Center, Children's community health center in Boston's Jamaica Plain neighborhood, took action. Through the "1,000 More Healthy Kids" campaign, staff educated families about the availability of insurance for their children and helped families complete the application process.

In the summer of 1998, less than one year after the campaign began, Martha Eliot exceeded its goal by enrolling more than 1,200 children in MassHealth (formerly Medicaid) or Children's Medical Security Plan. More than 40 percent of Martha Eliot's patient population had been uninsured or self-paying. The campaign reduced that population to less than 5 percent in the Department of Pediatrics and to less than 15 percent in the Department of Adolescent Medicine.

Martha Eliot staff members, children and community leaders join together to celebrate the "1,000 More Healthy Kids" campaign to enroll children in low-cost health insurance.

Hospital works to ensure access to pediatric specialty care

In 1998, Children's Hospital supported state and federal legislation designed to protect children and adults enrolled in managed care health plans. Of particular focus for Children's were provisions that ensure access to providers trained and experienced in pediatrics for all children in managed care plans.

While a "patient bill of rights" did not pass on the state or federal level during 1998, Children's Office of Government Relations and hospital clinicians are advocating for managed care reform that includes special protections for children during the 1999 legislative session.

Support for graduate medical education building

The ability to support training programs at pediatric academic teaching hospitals nationwide has been challenged by today's managed care environment. While adult academic medical centers receive support for training from the federal government (approximately $77,000 per resident annually), children's hospitals receive virtually no federal reimbursement for the training of pediatricians (approximately $400 per resident annually).

During 1998, Children's administrators and medical staff joined with other independent children's hospitals nationwide to educate Congress and the Clinton Administration about this inequity. In addition to personal visits to legislators and members of the President's cabinet, Chief Executive Officer **David S. Weiner** testified before the National Bipartisan Commission on the Future of Medicare in September, urging members to support an equitable financing system for graduate medical education. Legislation to provide federal funding for graduate medical education for children's hospitals has been introduced to Congress and is supported by President Clinton.

RESEARCH ENDEAVORS MAKE HEADLINES

The John F. Enders Pediatric Research Laboratories at Children's Hospital comprise the world's leading pediatric research program. Throughout 1998, promising research conducted at Children's drew the attention and interest of both the scientific community and the general public.

Children's lobbies for increase in federal research dollars

Federal support for biomedical research is essential to bringing cures and treatments from the laboratory to the bedside. In 1998, Children's representatives lobbied for budget increases for the National Institutes of Health (NIH), which dispense funding for biomedical research.

In the summer of 1998, both **Judah Folkman, M.D.**, senior associate in Surgery and director of the Surgical Research Laboratories (shown above), and **Bruce R. Zetter, Ph.D.**, research associate, testified before Congressional forums about the importance of federal funding for clinical research. In October, legislation passed, increasing the NIH budget for fiscal year 1999 by approximately $2 billion.

Tissue engineering offers corrective treatments

The ability to create human tissues and organs in the laboratory offers the hope of replacing failing body parts. Children's urologist **Anthony J. Atala, M.D.**, added credibility to the growing field of tissue engineering when he successfully transplanted laboratory-grown bladders into dogs. This work was published in the February 1999 issue of *Nature Biotechnology.*

Along with fellow urologist **David A. Diamond, M.D.**, Atala has improved patient care by using tissue engineering to correct urological problems, such as vesicoureteral reflux, a common defect in children that causes urine to back up into the ureter or kidneys. The two are overseeing a clinical trial that uses tissue harvested from the earlobe as the basis for corrective implants that repair vesicoureteral reflux.

During 1998, *Business Week* and *LIFE* magazines published cover stories on tissue engineering focusing on Atala's work and the pioneering efforts of other Children's physicians. This coverage also cited **John E. Mayer Jr., M.D.**, senior associate in Cardiovascular Surgery, who is working toward using bioengineered heart valves to replace faulty ones.

Laboratory works toward improvement of cancer therapies

The hope of new cancer treatments with angiogenesis inhibitors discovered at Children's Hospital (see feature article on page 16) was the source of innumerable reports by international print and broadcast news media throughout 1998, including *Time, Newsweek, The New York Times* and CNN. One such angiogenesis inhibitor, endostatin, has been identified as a top priority for development and testing by the National Cancer Institute. Clinical trials with endostatin are expected to begin in late summer or early fall of 1999.

In the meantime, Children's Surgical Research Laboratories continue to discover other angiogenesis inhibitors. In early 1999, Children's partnered with Genzyme Molecular Oncology, a Massachusetts-based biotechnology company, to develop another angiogenesis inhibitor discovered in 1998.

Anthony J. Atala, M.D., left, is one of several Children's clinicians researching the use of artificially grown tissues and organs.

Brain cell transplantation becomes a possibility

In 1998, **Evan Y. Snyder, M.D., Ph.D.**, assistant in Medicine (Newborn Medicine) and Neurology (Neuroscience), cloned the first neural stem cells from the human central nervous system. Published in the November issue of *Nature Biotechnology*, Snyder's work and the field of neural stem cell research have received broad coverage in scientific journals and the popular press, including *Newsweek* and *Business Week*, and international news media, including the BBC and MSNBC. Snyder's research offers the possibility of cell replacement and gene therapies for patients with neurodegenerative disease, neural injury or paralysis.

Researchers look at risks for teens

Understanding what influences adolescent behaviors is a growing research focus at Children's Hospital. In the August 1998 issue of *Pediatrics*, **Elizabeth Goodman, M.D.**, assistant in Medicine (Adolescent/Young Adult Medicine), co-authored a study that reported that teens who gamble are more likely to be involved in other risky behaviors, such as illegal drug use. These results were reported by CNN, ABC "World News Tonight" and *The Boston Globe Magazine*.

In other research, **Michael O. Rich, M.D.**, assistant in Medicine (Adolescent/Young Adult Medicine) (shown above), studied the influence of violence in teen music videos. In a study published in the April 1998 issue of *Pediatrics*, Rich concluded that music videos may be reinforcing and perpetuating stereotypes of typical aggressors and victims. His work, highlighted in *USA Today*, raises concerns about the effect of videos on adolescents' expectations about race, relationships and conflict resolution.

BUILDING COMMUNITY PARTNERSHIPS

An important focus for Children's Hospital is improving relationships with community-based providers. In 1998, the institution undertook several initiatives to better meet the needs of community physicians and hospitals, and, in turn, improve care and services for children and their families.

Bringing services to the community

During 1998, Children's expanded the delivery of outpatient specialty care at community locations throughout Eastern Massachusetts. In August, Children's physicians began offering outpatient services in six clinical specialties at Good Samaritan Medical Center in Brockton, Mass. Plans to bring specialty services to Caritas Norwood Hospital in Norwood, Mass., were also developed, and outpatient clinics opened in January 1999.

At South Shore Hospital in South Weymouth, Mass., Children's specialists have been offering outpatient care since 1997. The program expanded to include adolescent medicine, genetics and urology services in 1998. In late fall, Children's and South Shore also announced plans to expand their collaboration for inpatient services. Children's Hospital physicians are now delivering care in South Shore's Level II newborn nursery as well as its pediatric emergency room. Children's has provided inpatient consultation and care at South Shore since 1995.

Physician Relations supports referring providers

To enhance services for primary care and other community-based physicians, Children's Hospital established a Physician Relations function to foster two-way communication between referring physicians and the hospital. Since the spring of 1998, Physician Relations staff have listened to referring physicians' needs and have helped to develop programs in response.

In its first year, Physician Relations promoted Children's physician liaison program, which designates individual specialists as their department's principal contact for referring physicians calling with patient care issues. Physician Relations staff also focused on expanding electronic access to patient information for referring physicians, offering continuing medical education courses in the community, and increasing awareness of Children's community-based specialty services.

Vice president for Managed Care appointed

Michael I. Grady, M.D., was appointed to the new position of vice president for Managed Care in September. A longtime Boston pediatrician, Grady is overseeing strategic initiatives related to the managed care marketplace. His primary focus is developing a pediatric provider network that will contract with managed care organizations and HMOs on behalf of independent physicians, pediatric medical groups and specialists at Children's Hospital.

Prior to joining Children's, Grady was president of Greater Boston Primary Care Associates, a provider network representing twenty pediatric and adult primary care physicians. He also served as a member of Tufts Health Plan's Board of Directors.

Children's nurses, Paula Langone, B.S.N., R.N., and Anne Marchant, R.N., L.I.C.S.W., staff the Call Center, a new service for community-based pediatric providers.

Call Center offers customized service

In the summer of 1998, Children's Hospital piloted a Call Center for referring physicians. By offering centralized telephone service, the project facilitates communication between community-based and Children's physicians, helping to ensure that patients receive high-quality and coordinated care.

Based on the success of the pilot program, the Call Center is now available to all referring physicians. Staffed by Children's nurses, the Call Center links referrers to Children's specialists; disseminates information about a referred patient's admission; assists with scheduling appointments that involve multiple clinics; and provides general information about outpatient clinics, such as staffing and scheduling.

The Call Center expects to provide similar centralized service to patient families in 1999.

CHILDREN'S PREPARES FOR YEAR 2000

During 1998, Children's Hospital initiated efforts to ensure the hospital is prepared to safely and effectively deliver patient care and conduct business into the year 2000. Because many types of computer-driven equipment will not be able to process dates correctly into the year 2000, Children's experts and outside consultants have been working to test and replace or upgrade devices that may fail to operate or function after the millennium change.

Overseen by Eileen M. Sporing, M.S.N., R.N., executive vice president for Patient Care Operations, and Lac V. Tran, vice president for Information Services and chief information officer, an institution-wide work group is examining all medical equipment, facilities and building systems, and information technology.

CHILDREN'S HOSPITAL TRUST FORMED

As part of expanded efforts to promote philanthropic investment for the benefit of Children's Hospital, in 1998, Children's Board of Trustees approved the creation of the Children's Hospital Trust. A new entity, the Trust has enlisted a high-level, volunteer governing board to cultivate major gift opportunities for the hospital, along with the professional staff of the Trust. Chaired by Children's trustee Stephen R. Karp, the Trust board is growing to 30 members, including community leaders, philanthropists, hospital trustees and medical staff representatives.

In its first year, the Trust made significant strides in expanding fund-raising programs for Children's. Under the leadership of Janet B. Cady, president and chief operating officer of the Trust, philanthropic gift revenue for fiscal year 1998 was more than 30 percent above the average for the previous five years.

A FATHER'S SPECIAL GIFTS

Like all good fathers, Mike McBride has made plenty of sacrifices for his children. But, although he would never admit it, Mike has given much more than even the most devoted dads. When the youngest of his four children, Shannon, was a little girl, Mike donated his bone marrow to spare her life. And last spring, at the age of 55, he underwent a lengthy, rare operation to give Shannon half of his left lung, again saving her life.

But to hear Mike tell it, his unique sacrifices are all part of being a good parent. "I really don't think that what I've done is anything special," he says. "After all, we all do what we need to do for our kids." Shannon, now 27, begs to disagree. "My father is a very special person," she insists. "What other father would do all he's done – and never once stop looking at the bright side?"

Patient

CARE

Shannon McBride and her father, Mike

It hasn't always been easy to look on the bright side, even for Mike, a self-described optimist. In 1975, when Shannon was 4 years old, Mike and Shannon's mother, Mary, were given the devastating news that their little girl had acute lymphoblastic leukemia (ALL), a common form of childhood cancer.

"Today, thanks to enormous progress in research and treatment, the cure rate for [acute lymphoblastic leukemia] is better than 80 percent. But in the mid-'70s, when Shannon was diagnosed, the odds of her beating the disease were about 50-50, at best."

– Stephen E. Sallan, M.D.

"Today, thanks to enormous progress in research and treatment, the cure rate for ALL is better than 80 percent," says Shannon's longtime oncologist, Stephen E. Sallan, M.D., chief of the Oncology Service at Children's Hospital and chief of staff at Dana-Farber Cancer Institute. "But in the mid-'70s, when Shannon was diagnosed, the odds of her beating the disease were about 50-50, at best," he says.

Every three weeks for more than three years, one or both of the McBrides took Shannon for chemotherapy and radiation therapy, which often left her nauseated and exhausted. After the treatment ended, they were hopeful, even confident, that the cancer had been eradicated, but within several months Shannon suffered a relapse. Bone marrow transplantation (BMT) was her only option.

At that time, BMT offered only about a 10 percent chance of survival and all but guaranteed long-term complications, says Sallan. But without it, Shannon faced certain death. "We knew

this was a long shot and that it would be really tough for Shannon, but it was the only way to save her, so we had to try," says Mike.

Shannon and her parents made the trip from their home in Hopkinton, Mass., to Memorial Sloan-Kettering Cancer Center in New York City, then the nearest hospital offering the type of BMT Shannon required. Shannon's three siblings had been tested as potential bone marrow donors, but only Mike proved to be a sufficiently close match. He willingly underwent the procedure to harvest the bone marrow needed to replace Shannon's, which would be destroyed by the intensive, whole-body radiation given in a last-ditch attempt to wipe out her cancer.

Despite the long odds, 9-year-old Shannon pulled through the treatment and, after two "grueling" months in the hospital, went home. She did well until the following summer, when she developed the first of many bouts of pneumonia that sometimes landed her in the Multidisciplinary Intensive Care Unit at Children's Hospital.

According to Thomas R. Martin, M.D., assistant in Medicine (Pulmonary Medicine), whom Sallan asked to evaluate Shannon, the pneumonias were probably related to her pulmonary fibrosis, a condition in which scar tissue forms in the lungs, reducing their ability to expand. Pulmonary fibrosis is not unusual in patients who have undergone BMT, says Martin, particularly those, like Shannon, who had the procedure when treatments were far more toxic than they are today.

Despite the disruptions caused by her pneumonias, Shannon got on with her life. Although she missed many years of school due to her illness, she graduated from high school, earned a bachelor's degree in early childhood education, got her own apartment and landed a job she loves as a daycare teacher. Her lungs were functioning at less than half their capacity, but she was managing just fine. "I couldn't run, and I got out of breath quickly walking up hills," explains Shannon, "but it didn't really interfere with my life."

What was affecting the quality of Shannon's life, however, was recurrent, intermittent muscle pain, primarily in her back and neck. Sallan referred Shannon to Charles B. Berde, M.D., Ph.D., director of Children's Hospital's Pain Treatment Service. According to Berde, Shannon's pain may well have resulted from her intensive cancer treatment. "Over the years, we have used a variety of techniques to help treat and manage Shannon's pain," says Berde. These have included exercise, self-hypnosis, biofeedback, medications and nerve block injections. "Dr. Berde always accepted that my pain was real," says Shannon, "and he wouldn't give up until we found something that worked for me."

Shannon plays with a child from the daycare center where she works as a teacher. Since her lung transplant, Shannon has returned to work part-time.

About four years ago, Shannon's lung function inexplicably began to decline. "I no longer had the same energy I used to," she says. "I'd get winded walking on flat surfaces. I couldn't even sweep my apartment or sing Christmas carols. It was awful."

Testing of Shannon's lung function indicated that it had slipped from 40 to about 30 percent of normal values. After an extensive multidisciplinary evaluation, the physicians involved in Shannon's care concluded that the decline might be due, at least in part, to muscle weakness in her chest and elsewhere. They prescribed an intensive program of pulmonary rehabilitation that, according to Children's physical therapist Anne Gould, P.T., involved 18 months of special exercises designed to boost Shannon's strength and endurance.

"Shannon was typically conscientious and her strength markedly improved," says David A. Waltz, M.D., assistant in Medicine (Pulmonary Medicine) and medical director of the Lung Transplantation Program, who became involved in Shannon's care in 1996. "But her symptoms remained. It became obvious that a significant part of her decline was due to her pulmonary fibrosis and that she was on a downward trend – one that she might not ultimately survive," he says. "That was when we began to seriously discuss a lung transplant."

Although putting Shannon on a waiting list for a lung from a deceased donor was an option, the possibility of using the lobe of a lung from a living-related donor, specifically her father, was considered. According to Waltz, two of the biggest hurdles with lung transplantation are rejection, as the body's immune system fights to rid itself of the foreign organ, and infection, a significant risk posed by drugs given to suppress the immune system. "Because Shannon has her father's immune system from the bone marrow transplantation, we believed her body would not reject the lung and that she would not need immunosuppressant drugs," says Waltz. "Because of her history, Shannon had a unique advantage."

Waltz emphasizes that the decision to use a living-related donor in lung transplantation is not taken lightly. In fact, since the procedure was first done in 1990, only a few dozen have been performed in the U.S., primarily because of the risks to donors, who face major surgery, a lengthy recovery and permanently diminished lung capacity. Mike understood all these risks, but still had no reservations. "If Shannon had a shot with my lung, I wanted to give her that chance," he says.

Even so, Waltz and Children's senior surgeon Craig W. Lillehei, M.D., insisted that Mike undergo an independent evaluation at Massachusetts General Hospital to make sure he was physically and psychologically fit to be a donor. Mike passed with flying colors and the surgery, the first living-related donor lung transplant ever performed at Children's, was scheduled for May 1998.

The surgical team included Lillehei and Robert C. Shamberger, M.D., from Children's Hospital, as well as three surgeons from other Boston teaching hospitals that participate in a multi-hospital lung transplantation consortium. According to Lillehei, the lengthy, complex procedure went off without a hitch. "The lobe of Mike's lung fit beautifully within Shannon's chest. In fact, because she is much smaller than Mike, it is virtually the same size as her other lung," he says.

Within days, Shannon was up and about, astonishing everyone with her quick recovery. "I felt the improvement while I was still in the hospital," recalls Shannon. "Suddenly, I no longer had to think about my breathing." Mike describes his surgery as "a breeze," but it took him longer than his daughter to get his strength back.

Today, both Shannon and Mike are doing fine. Shannon goes on two-mile walks and has returned, part-time, to her daycare job. "Since the transplant, things are getting better every day," she says. Mike is busy running his real estate business and has even resumed his golf game.

According to Waltz, Shannon has shown no sign of rejecting her new lung, and her lung function, which returned quickly to the pre-transplant level, may improve even further. "Shannon's long-term prognosis went from very poor to very good," he says. Lillehei puts it this way. "Before the transplant, Shannon was a ball of energy from the neck up. Now, she's a ball of energy from the neck down, too."

Last June, a month after the transplant, Shannon was wondering what to get Mike for Father's Day. She decided to give him the letter she had written him shortly before the transplant surgery, which he would have been given if she had not pulled through. In the letter, she touchingly thanks her father for all he has given her throughout her life. While Mike treasures the letter, he says it was unnecessary, because he had already been given the best Father's Day gift of all – his daughter.

"Because Shannon has her father's immune system from the bone marrow transplantation, we believed her body would not reject the lung... . Because of her history, Shannon had a unique advantage."

– David A. Waltz, M.D.

RESEARCH

DR. JUDAH FOLKMAN

PERSISTENT PIONEER

While working during the mid-1960s as a draftee at the National Naval Medical Center in Bethesda, Md., a young surgeon named Dr. Judah Folkman noticed something intriguing – the cancer cells he kept alive in a glass chamber all sprouted into tumors the size of pencil points, then mysteriously stopped growing. Yet when he implanted cancer cells into a mouse, the tumors expanded wildly, as cancers are so prone to do.

Folkman realized that tumors in animals had something those in the chamber lacked – an abundant supply of blood vessels. "For the first time, we saw that without blood vessels, there is a severe restriction of tumor growth," recalls Folkman, now 66 and director of the Surgical Research Laboratories at Children's Hospital, Boston. He points out that doctors had long observed that tumors were packed with blood vessels, but it was widely believed that these were merely the result of inflammation and not necessary for tumor growth.

Judah Folkman, M.D

Folkman's observation, and his bold interpretation of its significance, has sparked a revolution in the understanding of some of humankind's greatest scourges – knowledge that could someday lead to entirely new treatments for diseases as diverse as cancer, stroke and heart disease.

Starving tumors into submission

Not long after his stint in the Navy and his surgical residency, Folkman joined Children's Hospital. At the age of 34, he was appointed a full professor at Harvard Medical School, one of the youngest physicians ever to be awarded that position. The next year, he became the hospital's surgeon-in-chief.

Despite his demanding operating room schedule, the indefatigable Folkman continued his research in a small lab at the hospital. The results convinced him that tumors were dependent on the formation of new capillaries, blood vessels thinner than a human hair, for their growth. Deprived of a vast new network of capillaries and the nutrients and oxygen they provided, tumors would grow no larger than the size of a pea, starved into a "steady state" of submission, believed Folkman. Moreover, without capillaries, the tumor's cells would lack an adequate escape route, so they could not migrate to other sites in the body, or metastasize, to establish the tumor colonies that are ultimately responsible for most cancer deaths.

Michael Klagsbrun, Ph.D.

The development of new blood vessels, a process called angiogenesis, is normally a short-lived event, triggered in adults mainly during wound healing and the menstrual cycle. Folkman theorized that a tumor somehow subverts this normal process, switching on angiogenesis to generate the hundreds of new capillaries it needs to grow and metastasize. "I believed that if we could control angiogenesis, we could control tumor growth," explains Folkman. It was a novel concept: Rather than attacking the enemy head on, you could render it powerless by choking off its supply lines and escape routes.

Big conclusions, little support

There was, however, one problem. Hardly anyone believed Folkman. In fact, most scientists thought his theories were at best unsubstantiated and at worst downright absurd. Journals turned down Folkman's papers with depressing regularity, reviewers ridiculed his assertions, and scientists snickered during his lectures. Even when Folkman's work was finally published in *The New England Journal of Medicine*, in 1971 (now considered the seminal paper in the field of angiogenesis), the critics were outspoken. "I'd go home, utterly depressed, and my wife, Paula, would say, 'What does it matter what they think, if you believe this is valid?' It wasn't always easy to ignore the critics," he confesses, "but Paula was right."

And so was Folkman. But it took persistence, passion for the truth, and decades of hard work – on his part and the part of many other talented researchers who threw caution to the wind and joined his lab – to prove it.

A series of breakthroughs

The first breakthrough came in 1973, when Michael Gimbrone, M.D., a student in Folkman's lab, succeeded in making the first cultures of vascular endothelial cells, the cells that line the body's blood vessels. This important step enabled Folkman and his colleagues to more thoroughly test their theories about angiogenesis.

Another important breakthrough took place during the early '80s, when Children's biochemists Michael Klagsbrun, Ph.D., and Yuen W. Shing, Ph.D., discovered the first molecule that triggers angiogenesis. This was another great leap forward, because until that time the existence of such a trigger had only been theoretical. Secreted by tumors, the angiogenesis inducer they identified and purified was basic fibroblast growth factor, or bFGF. Since then, more than 15

Yuen W. Shing, Ph.D.

Deprived of a vast new network of capillaries, tumors would grow no larger than the size of a pea, starved into a "steady state" of submission, believed Folkman.

angiogenesis inducers have been discovered. Klagsbrun says that bFGF and many other angiogenesis inducers are showing promise in clinical trials of patients who could benefit from new blood vessels, such as those with severe coronary artery disease, peripheral vascular disease or stroke.

Once a protein that sparked angiogenesis was found, the search was on for substances that would inhibit the process. After 14 years as Children's surgeon-in-chief, Folkman resigned this position to devote himself full-time to research.

The trade-off was worth it, because by the mid-'80s, the first angiogenesis inhibitors were discovered in his lab. The first to be tested in humans was interferon alpha, with "very beneficial results in children," says Folkman.

Improved treatment of hemangiomas

It was Bruce R. Zetter, Ph.D., a cell biologist in the Surgical Research Laboratories, who discovered that interferon alpha, an agent approved for the treatment of hepatitis and other conditions, stopped the movement of endothelial cells, necessary for the growth of new capillaries. Other investigators subsequently demonstrated that interferon alpha was anti-angiogenic in animals.

In 1998, a physician in Denver contacted Folkman about a patient who faced imminent death from a hemangioma of the lung. Hemangiomas are an abnormal proliferation of blood vessels that affect about one in 100 infants. Most disappear on their own as the child grows, but about 5 percent can interfere with vital organs and become life-threatening. The standard therapy, corticosteroids, fails in up to 70 percent of these cases.

Folkman suggested using interferon alpha to treat the patient's hemangioma. The therapy was a success, and the case was reported by the Denver group in 1989 in *The New England Journal of Medicine* as the first anti-angiogenic treatment in a human. In 1992, another published study, conducted by Children's hematologist Alan B. Ezekowitz, M.B., Ch.B., plastic surgeon John B. Mulliken, M.D., and Folkman, also showed significant results.

Bruce R. Zetter, Ph.D.

Donald E. Ingber, M.D., Ph.D., at right

... experiments with mice demonstrated that both angiostatin and endostatin not only inhibited tumor growth, but actually caused tumors to regress to a microscopic, dormant state.

Of the 20 children involved in that study, 18 experienced regression of large, life- or sight-threatening hemangiomas. A side effect of delayed walking or a stiffness of the lower limbs was found in 5 to 10 percent of the sickest infants. But these symptoms usually went away when the drug was discontinued. "Today, interferon alpha is broadly used to save children with these formerly untreatable hemangiomas," says Folkman.

Other inhibitors show promise in patients

Another first-generation angiogenesis inhibitor discovered in Folkman's lab was found by Donald E. Ingber, M.D., Ph.D., in 1985. After it was shown to slow the growth of a broad range of tumors in animals, Ingber's compound, eventually called TNP-470, became the first anti-angiogenic therapy for cancer patients to enter clinical trials.

Ingber says that TNP-470 is now in Phase II clinical trials in adult and pediatric patients with many different types of solid tumors, including brain, breast, pancreas, cervix and kidney. Animal studies suggest that TNP-470 also increases the effectiveness of conventional cancer therapies, such as radiation therapy and chemotherapy, and clinical trials using TNP-470 in combination with conventional chemotherapy agents are currently under way. In animals, TNP-470 also appears to be an effective therapy for rheumatoid arthritis, which is caused partly by excessive blood vessel formation.

In 1994, another researcher in Folkman's labs, ophthalmologist and neuropharmacologist Robert D'Amato, M.D., Ph.D., discovered that thalidomide, the notorious anti-nausea drug that caused major birth defects among thousands of infants during the 1950s, is anti-angiogenic.

According to D'Amato, thalidomide is now in clinical trials for the treatment of a number of cancers, and is showing a "significant response" among patients with a particularly deadly form of brain cancer called glioblastoma, as well as Kaposi's sarcoma and multiple myeloma. The drug is also being tested in a small group of patients with age-related macular degeneration, a leading cause of adult blindness resulting from abnormal blood vessel growth in the retina. Thalidomide will also soon enter clinical trials of patients with renal, lung, and head and neck cancer, says D'Amato.

Robert D'Amato, M.D., Ph.D.

Tumors source of angiogenesis inhibitors

For some time, Folkman and others working in the field had theorized that, counter-intuitive though it seemed, tumors themselves might be a source of angiogenesis inhibitors, as well as inducers, and that it was the balance between the two that determines whether angiogenesis is turned on.

In the mid-'90s, after years of painstaking work, Michael S. O'Reilly, M.D., of Folkman's lab, found that tumors do indeed churn out anti-angiogenics, including two of the most potent yet discovered, angiostatin and endostatin.

O'Reilly explains that experiments with mice demonstrated that both angiostatin and endostatin not only inhibited tumor growth, but actually caused tumors to regress to a microscopic, dormant state. "The cancer cells were there, but remained dormant for the normal lifespan of the mouse," he notes.

Moreover, the mouse tumors did not become drug resistant. Cancer cells mutate quickly and become resistant to cancer drugs, but in experiments conducted with endostatin by post-doctoral fellow Thomas Boehm, M.D., the tumors in these mice did not develop drug resistance with long-term therapy. And because these agents specifically target only endothelial cells, there were no side effects in the mice. Preliminary experiments using angiostatin and endostatin together have shown complete eradication of one type of lung tumor in mice, suggesting the two may act synergistically.

While the early generation anti-angiogenics are showing some promise in humans, angiostatin and endostatin have been tested only in mice, says Folkman, who is greatly troubled by publicity that has falsely raised many cancer patients' hopes. "We can't draw any conclusions at all about their efficacy in humans until they have been tested in clinical trials in large numbers of patients," he stresses. Getting endostatin into clinical trials, a priority of the National Cancer Institute, is planned for late 1999, although that timetable could be delayed, cautions Folkman, ever wary of raising false expectations.

Michael S. O'Reilly, M.D.

Today, the field of angiogenesis has become one of the hottest areas of medical investigation. Hundreds of papers are published each year, dozens of clinical trials involving thousands of patients are under way, and the search for more angiogenesis inhibitors and inducers – and potential new applications for each – continues at a steady clip at laboratories around the world, as well as at the Surgical Research Laboratories at Children's Hospital.

Despite this remarkable progress, dozens of prestigious awards and the international renown his work has brought him, Folkman, a notoriously modest and hard-working man, is not at all tempted to rest on his laurels. Indeed, just as he was more than 35 years ago when he started work in this field, he is excited by all that remains to be understood. "We still have so much to learn," he says, as he heads back to his lab and the discoveries that await.

For more information about current clinical trials of anti-angiogenesis agents, contact the National Cancer Institute's Cancer Information Service at 1-800-4-CANCER or visit http://cancertrials.nci.nih.gov.

TRAINING

A CHANGING LANDSCAPE

PREPARING TRAINEES FOR THE FUTURE OF HEALTH CARE

On July 1, 1998, Children's Hospital introduced an innovative system of patient care delivery and medical education. The most comprehensive of its kind in an academic pediatric hospital, the new system is structured to give medical residents training that is ultimately more suited to the realities of practicing medicine today.

Under the new system, the Department of Medicine is organized into two multispecialty services, known as "firms." The new structure is unique because it aligns patients and their care givers by medical specialty, across inpatient and outpatient settings. This approach replaces a system where patients were cared for by separate clinical teams in the inpatient and outpatient settings, and a system where medical patients were admitted to hospital units based on age rather than disease type. The firms, called the Kenneth D. Blackfan and the Charles A. Janeway Medical Firms, are each headed by a physician chief and a nurse director.

Lise Edelberg, M.D.

Frederick H. Lovejoy J

Vincent W. Chiang, M.D.

Joseph I. Wolfsdorf, M.B., B.Ch.

Sarah K. Wood, M.D.

The following roundtable discussion about the firm system's impact on medical education took place among five Children's physicians involved in its planning and implementation. They are Frederick H. Lovejoy Jr., M.D., associate physician-in-chief and vice chair for Education; Joseph I. Wolfsdorf, M.B., B.Ch., senior associate in Medicine (Endocrinology) and chief of the Janeway Firm; Vincent W. Chiang, M.D., assistant in Medicine (Emergency Medicine) and core attending for the Blackfan Firm; Sarah K. Wood, M.D., chief medical resident; and Lise Edelberg, M.D., second-year resident.

THE EVOLUTION

Lovejoy: To understand the new firm system at Children's, it's important to look at where we've been. The precursor was the service chief system, which was predominantly inpatient in its orientation. It established a curriculum that was coordinated on a particular hospital unit.

In the mid-1990s, we began to ask if we were structuring education correctly if we were separating inpatient care from outpatient care. As lengths of hospital stays decreased and care was being delivered on an outpatient basis more often, a consensus arose that we needed a new training model to incorporate outpatient settings. That was the genesis of a Clinical Advisory Group, which met for two years to develop the new firm system.

Wolfsdorf: This fuller integration of inpatient and outpatient programs was an important reason why I wanted to be involved in the new system. In my own discipline, very few children with endocrine disorders, other than those with diabetes, ever get admitted to the hospital. Residents would become well-versed in managing diabetes, but were rarely exposed to the many things an endocrinologist or a general pediatrician sees in the office – such as short stature and delayed puberty. Now, because our residents are rotating from the inpatient service to the outpatient clinics, they are learning more about the scope of these disorders, and we are providing a solid foundation for a career in pediatrics as it is truly practiced.

Wood: While the firm system is a big change, underlying it are the fundamental goals that we've always had: high-quality patient care, education and teamwork. As we looked to the future of pediatric medicine, we realized, as an institution, that this shift needed to happen to give us more of an outpatient focus and to get us thinking about efficiency of care.

THE BENEFITS

Edelberg: I think the new system really benefits resident education. Each rotation now focuses on one subspecialty. Those of us in training can really spend time thinking, reading and learning in greater depth about each field.

We also now have more continuity with patients: We're there when they get admitted to the hospital, we help stabilize them and teach them about their diagnoses, then we see them at the follow-up appointment one week later. In those cases, we really learn about how a child lives with that disease.

Wolfsdorf: Residents now work several hours a day with specialists. Their education is expanded tremendously by having direct access to the world authorities and marvelous subspecialty services that this institution is famous for.

Another benefit of the new system is that we have a cadre of eight core attendings – individuals who spend several months a year managing the general pediatric services. On a daily basis, these physicians oversee the work of the residents, round at the bedside and are available for formal and informal education.

But they are doing more than just traditional pediatric education. They are also responsible for paying attention to the cost-effectiveness of care. Learning how to practice state-of-the-art medicine while at the same time not wasting resources is a high priority for education today. So, having this group of individuals with the focused task of both managing patient care and teaching residents about these issues is a major change.

Wood: The new structure also brings together a multidisciplinary group of people. On many of the subspecialty teams, there's a nurse practitioner, nurses with expertise in the particular specialty as well as social workers. In the old system, many of these professionals were primarily based in outpatient clinics. But now, the inpatient experience benefits from their perspectives. The social worker may have a lot of information about a family, or the diabetes nurse may know a lot about the child's medical history. It's very helpful for residents to work closely with these different professionals, and it improves services for patients and families.

TEACHING AND LEARNING

Chiang: It's a real advantage that the house staff now works for a much longer part of the day with subspecialists, learning directly from people with a lot of experience. However, much of resident education is also peer-based; that is, residents teach other residents. Ultimately, the responsibility for care rests on the attendings, but we want to uphold the educational goals of the residency to let senior residents do some of the teaching themselves.

Lovejoy: One of the biggest challenges in medical education is figuring out the role of choice in clinical decision-making. While close supervision of house staff is necessary to maintain excellence in patient care, residents also need to be given the chance to struggle and think very hard about their choices, rather than having an answer readily available to them, because it is that struggling and thinking that ultimately makes a great physician.

We are also trying to develop moral, caring physicians. The firm also lends itself to that goal by closely juxtaposing residents with attendings. The house staff now has the opportunity to observe many different models and attitudes in the delivery of care and to decide 'that is something I like and want to emulate.'

Chiang: The core attendings also have the opportunity to teach residents about such things as evidence-based medicine. Training has become more focused on looking at the data critically and changing from the anecdotal practice of medicine – 'I do this because it has worked for me in the past' – to evidence-based medicine – 'I do this because I have looked at all the data and I think this is the best of our alternatives.' As my colleagues and I teach, we hope to develop this intellectual curiosity in the house staff.

Edelberg: The firm system enables residents to make better-informed decisions about the area of medicine they want to pursue. Under the old system, you were taking care of patients with all kinds of diagnoses simultaneously, and getting broad-based exposure to many different pediatric specialties. Now, you learn about a particular subspecialty through training in the clinics and watching how subspecialists practice day-to-day. It's a tradeoff: You may get a more selective idea of the subspecialties, but you get a more realistic one.

IMPACT ON PATIENT CARE

Wolfsdorf: Teaching institutions like Children's Hospital are facing huge challenges because of managed care. The industry is placing demands on how we do our work, and how we do our work, in turn, affects how we educate our residents and fellows. As we designed this new system, we recognized that although we would be focusing intensively on education, the kind of work we do makes it impossible to separate training from clinical care. We must always consider the impact that education is going to have on care.

Wood: One of my favorite anecdotes of the firm's new approach was when one of the interns was really excited to get the opportunity to visit a patient at a school for kids with chronic disabilities. You used to see so many different types of patients in the hospital, but you didn't always have a chance to appreciate the other parts of patients' lives, particularly with chronically ill patients. But since the firm shift, you have the opportunity to get out into the community more and see what patients' lives are like before and after they come to the hospital. Not only is this an educational process, it's an empathetic process: You see children less as patients and more as people.

Chiang: We do have some evidence that parents and families are more satisfied with the care their children are receiving. We know from surveys in the past that families were often unfamiliar with a teaching hospital and didn't know what each doctor – the intern, resident, fellow or attending – is supposed to do. Now, that we have created a group of residents and attendings with more dedicated time to spend with families, I think families understand much more how a teaching hospital works and how decisions are being made.

Lovejoy: Therein lies the advantage of a teaching hospital, I believe: The best chance for the best care comes from multiple minds teaming up to determine how to deliver care well. And that's the great potential of Children's firm system, in which very talented people – our physicians, nurses and house staff – work closely together to decide what is best for a very sick child.

Each firm has specialty teams that care for patients based on their diagnoses in both inpatient and outpatient settings.

Kenneth D. Blackfan Medical Firm
General Pediatrics
Allergy and Immunology
Gastroenterology/Nutrition
Genetics/Coordinated Care/
Developmental Programs
Hematology
Short Stay

Charles A. Janeway Medical Firm
General Pediatrics
Adolescent Medicine
Endocrinology
Infectious Diseases
Nephrology
Pulmonary

Glossary of Terms

Core attending
A physician who has ultimate responsibility for patient care and is directly involved in resident education and communication with referring physicians

House staff
Physicians-in-training (interns and residents) who participate in day-to-day patient care

Residency
The period of training for new physicians after graduation from medical school. Residencies last three to five years.

Resident
A physician in a training program at an academic medical center following four years in medical school

Intern
A resident in his or her first year of training

Rotation
A period of time (generally one month) that an intern or resident trains in a given clinical area

A HELPING HAND

CARING FOR CHILDREN BY ENABLING PARENTS

SERVICE

o m m u n i t y

In Charles Morgan's dreams at night, he often appears as Superman. The single parent of four young children envisions himself as capable of accomplishing superhuman feats. In Charles' waking life, he spends each day juggling the overlapping schedules of his children, Lorecco, 5, twins Tyrone and Tyrell, 4, and Natia, 3, while trying to find time to shop for groceries, do laundry and pay the bills. Helped by his devotion to the children, and by the intensive support of Children's Community Early Intervention Program over the past four years, Charles has indeed accomplished significant feats in raising his children.

Charles Morgan first brought his son Lorecco to Children's Community Early Intervention Program in 1994 for the boy's language and developmental delays. The satellite program of Children's Hospital had just opened that year, and Charles and Lorecco were one of the first families to be seen at the Mission Hill-based program. An energized team of social workers, developmental educators, speech therapists, family

Gaby Cavallacci, second from left, and Patricia MacAllister, seated, visit the Morgan family, clockwise, Natia, 3, Tyrell, 4, Charles, Lorecco, 5, and Tyrone, 4.

WORLD SPOR
Sports
Gear
EVERLAST
MINNIE
MOUSE

Patricia and Gaby help Charles with the household finances.

... Children's Community Early Intervention Program is especially committed to ensuring that children have what they need most: a functional and loving parent.

advocates and physical and occupational therapists were there to help Charles and Lorecco, and provide comprehensive developmental services to children in the community, from birth to age 3, who are at medical, neurological or environmental risk. The staff also links families with primary care providers, often at Martha Eliot Health Center (Children's neighborhood health service in Jamaica Plain, Mass.), and specialists at Children's when necessary.

Beyond the services it offers to address children's medical and developmental needs, Children's Community Early Intervention Program is especially committed to ensuring that children have what they need most: a functional and loving parent. "We address children's issues by working with parents and letting them know we believe in them," says Caren Plank, M.A., L.M.H.C., director of the Early Intervention Program. "We want parents to leave here feeling proud of themselves and good about their future. This means a tremendous investment of time and effort, but it's that effort, of course, that ultimately benefits the children."

The tremendous investment by the Early Intervention Program staff usually comes through visits to children and their parents at home, at daycare or other community settings. From the beginning, case manager Gaby Cavallacci, L.I.C.S.W., and family advocate Patricia MacAllister worked closely with Charles Morgan. At least weekly, they met with him at his home to help with everything from supervising the children's physical and speech therapy exercises, to keeping up with his bills, to building his confidence as a single parent.

Then in 1995, with his three young sons all participating in the Early Intervention Program, Charles learned that he had an infant daughter. Born prematurely, the baby girl had been taken from her mother at birth and placed in the custody of the Department of Social Services (DSS). As soon as he met little Natia, Charles turned to Cavallacci for help in winning custody of her. "The custody issue was over whether a single father could raise a little girl," says Cavallacci. "It's obvious to anyone who talks to Charles for five minutes how committed he is to his children. I was ready to do whatever I could to help him."

In the ensuing months, Cavallacci became closely involved with Charles and his family, as they worked together to meet DSS's custody conditions. To meet one such condition, Cavallacci helped Charles find a new apartment with more space for the four children, a move he made willingly even though it meant leaving Mission Hill – the neighborhood he had lived in all his life.

When Charles had his day in court, "the judge could see that he was really something," says Cavallacci. "Not only did he grant Charles custody of Natia, he wanted him to have all the support possible." Cavallacci and the Early Intervention Program staff again filled that role, helping Charles in parenting groups, working with him on Natia's emotional adjustment to her new family situation, and answering his questions when he discovered, for example, that toilet training for a girl is different than for a boy. "Gabby has always been by my side," says Charles. "This program has taught me to take care of my kids and give them what they need. It's a lot of work, and I get really tired most days, but the kids keep me going."

A critical element of the program is its location and facility on Tremont Street, which provides a space where families may attend scheduled parent support groups, parent-child groups and toddler play groups – or just drop in. "By being right on Tremont Street, where families go to church, buy their groceries and make their daily rounds, we are woven into everyday life," says Plank.

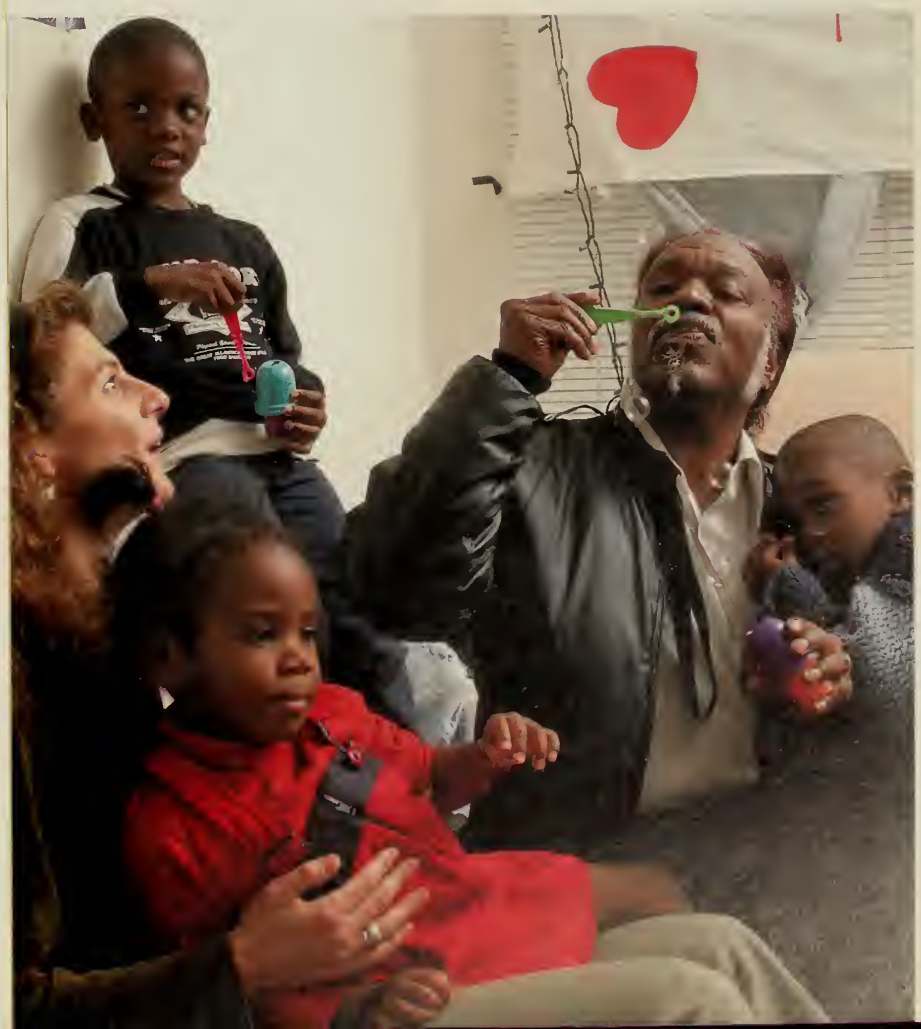
In late 1997, Children's Hospital provided the funding that enabled the program to move from the cramped office space it had shared with another organization into a larger storefront facility on Tremont Street. After its first year at the bright, new center, multicultural artwork adorns the walls alongside children's drawings; the central meeting room is filled with toys; and the refrigerator is kept well-stocked for families and staff. "It's important that this be a comfortable, friendly place for families to visit," says Plank.

Working with the community has been a critically important part of the success of the program. "Since we were seeing many early intervention patients from the Mission Hill neighborhood at the hospital and at Martha Eliot Health Center, we decided to extend our services right into the community," says Janice Ware, Ph.D., director of Pediatric Psychology in the Division of General Pediatrics and executive director of the program. "We felt it was important to partner with the Mission Hill community to win grassroots support for the program. With that support, the program filled up as soon as it opened." Since its opening, the program has followed approximately 400 families.

Throughout their four years with the program, the Morgans have touched the staff deeply. Charles Morgan's story, says Plank, embodies the spirit of Children's Community Early Intervention Program. "We have many children and families who are high-risk, and we address a host of issues and needs in the community. Yet, what we have tried to do with Charles and his family is perhaps what we do best: give parents encouragement that their daily struggles are worthwhile, and that they're doing a good job. We are moved by what they're trying to accomplish; our lives are changed by them as much as theirs are by us."

The relationship forged between the Early Intervention Program staff and the Morgan family bears out the effectiveness of Plank's philosophy. To walk into the Morgan home is to witness the amount of energy and pride Charles shows his children. A calendar follows each child's weekly schedule and marks field trips and holiday breaks. The walls are covered with family pictures and certificates of accomplishment for participating in early intervention or other community programs, seals for perfect attendance, school papers and drawings. Today, Lorecco, Tyrell, Tyrone and Natia are attending school, and Natia clings to her older brothers as they play and tease.

Now Natia is 3 years old and the Morgan family has graduated from Children's Community Early Intervention Program, ready to move forward on their own, armed with family fortitude and love.



STATISTICS

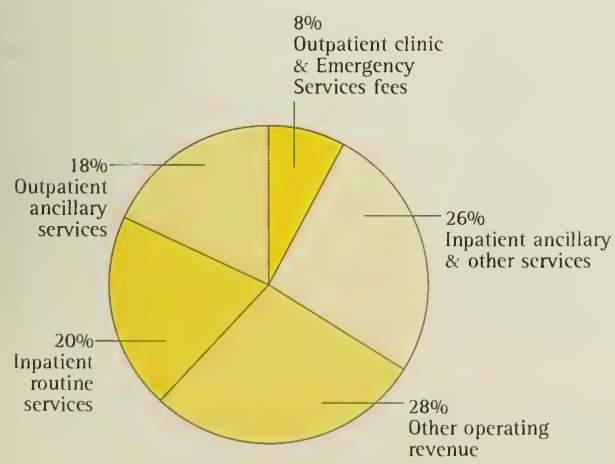
	1998	1997
Patient:		
Number of licensed beds	324	325
Discharges	16,624	16,499
Patient days	86,825	84,017
Observation days	2,519	2,155
Average stay in days	4.67	4.62
Clinic visits	248,097	235,027
Emergency Services visits	49,247	50,414
Surgical Procedures:		
Inpatient	8,560	8,196
Outpatient	8,090	7,033
Total	16,650	15,229
Radiology procedures performed	88,438	90,026
Laboratory tests	1,372,923	1,316,044
Personnel:		
Active medical staff	743	706
Active dental staff	21	20
Affiliate medical staff	35	38
Associate scientific staff	233	236
Courtesy staff	301	301
House staff	671	604
Consultant staff	68	68
Emeriti	44	42
Visiting staff	3	7
Nursing staff	708	800
Other full-time employees	2,510	1,871
Other part-time employees	826	557
Volunteers	850	892

STATEMENT OF REVENUES AND EXPENSES

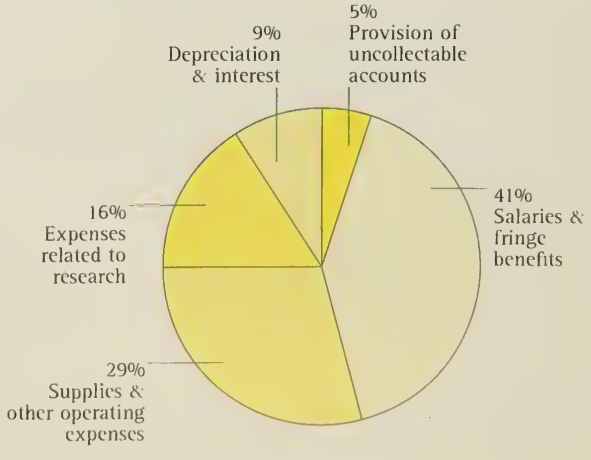
and funds used for capital additions years ending September 30, 1998 and 1997 (in thousands of dollars)

	1998	1997
Revenues:		
Gross patient services revenue	$ 380,757	$ 344,233
Deductions from patient services revenue	(145,475)	(124,132)
Net patient services revenue	235,282	220,101
Other operating revenue	150,514	130,569
Total Operating Revenues	**385,796**	**350,670**
Operating Expenses:		
Salaries and wages	141,133	125,300
Operating expenses	136,042	108,528
Depreciation and amortization	31,659	29,896
Interest	5,797	6,287
Provision for uncollectable accounts	20,912	21,488
Expenses related to research	62,600	61,042
Total Operating Expenses	**398,143**	**352,541**
Surplus (loss) from patient care operations	(12,347)	(1,871)
Prior-year settlements	227	(257)
Excess of Expenses over Revenues	**$ (12,120)**	**$ (2,128)**
Capital additions	42,904	36,127

SOURCES OF REVENUES



DISTRIBUTION OF EXPENSES



CONSOLIDATED BALANCE SHEET

years ending September 30, 1998 and 1997 (in thousands of dollars)

	1998	1997
Assets:		
Current assets:		
Cash	$ 286	$ 400
Accounts receivable, net	78,001	76,654
Inventories	2,708	2,679
Prepaid expenses	1,713	1,165
Current portion of assets whose use is limited	6,936	6,930
Due from parent	0	0
Total Current Assets:	89,644	87,828
Assets whose use is limited:		
Under deferred compensation agreements	8,812	8,927
Under long-term debt agreements	382	356
Unamortized bond issuance fees	1,146	1,249
Plant, property and equipment, net	254,703	242,751
Total Assets:	$ 354,687	$ 341,111
Liabilities and Net Assets:		
Current liabilities:		
Current portion of long-term debt	$ 4,120	$ 3,955
Accounts payable and accrued expenses	61,191	54,378
Due to third-party payors	7,295	4,556
Due to parent	16,559	9,458
Funds held for others	2,901	2,656
Total Current Liabilities	92,066	75,003
Long-term debt, excluding current portion	110,367	114,342
Deferred compensation	8,812	8,927
Long-term portion of estimated third-party liabilities	6,949	2,177
Deferred revenue	5,553	6,876
Reserve for medical malpractice	2,293	2,752
Total Liabilities	226,040	210,077
Net assets:		
Unrestricted	127,428	129,880
Temporarily restricted	1,219	1,154
Total Net Assests	128,647	131,034
Total Liabilities and Net Assets	$ 354,687	$ 341,111

Children's licenses some of its research discoveries to companies for research and/or commercial development, and in return sometimes receives equity, either as capital stock or as options to buy capital stock, as partial consideration for license. In fiscal 1998, Children's owned license-based equity in the following companies under such arrangements. Boston Life Sciences, Inc., BioMorphics Group, Inc., Caliper Technologies Corp., Inc., EntreMed, Inc., ProCell Pharmaceuticals, Inc., and UroSurge, Inc.

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In 1998, Children's Hospital was served by a corps of 850 volunteers who provided more than 80,000 hours of service. The volunteers listed below completed 10 or more years of service in 1998.

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The Rev. Joseph Bassett	26 years
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When you support Children's Hospital, you are giving hope to sick children everywhere. The kindness and generosity of one person has the power to make a world of difference in young lives.

Whenever a child is in need, whether from around the corner, across the country or on the other side of the world, Children's must always be here, providing compassionate, life-saving treatments, ground-breaking research and the very best medical care. Your support helps to sustain Children's as the best pediatric hospital in the country and also serves as inspiration to those who are dedicated to the health and well-being of children. As you consider the following opportunities to make a philanthropic gift, please remember that every contribution makes a difference.

- Support Children's Hospital with a donation of cash, appreciated securities or personal property.
- Remember Children's Hospital through a bequest in your will.
- Honor someone special or recognize an important event, such as a birthday, wedding or graduation, with a memorial or tribute gift.
- Organize a special event in your community to raise funds for Children's.
- Create an endowment or a named fund designated to a field of research or patient care that is of special interest to you.
- Designate Children's Hospital through your employer's matching gift program or through a payroll giving program.
- Purchase Children's Hospital holiday cards.
- Support the WBZ-Children's Hospital Fund during the annual Children's Hospital Telethon on WBZ-TV 4 in December.
- Plan a gift that provides income for life, such as a gift annuity or charitable remainder trust.

For more information about any of the above opportunities, please call the Office of Development, Children's Hospital, Boston, at (617) 355-6890, or visit the hospital's website at www.childrenshospital.org/development.

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